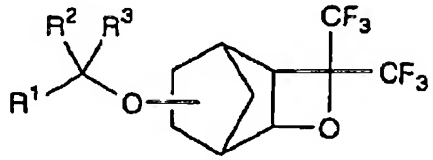
CLAIMS

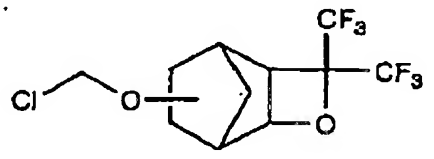
1. A fluorine-containing cyclic compound represented by general formula (1):



(1)

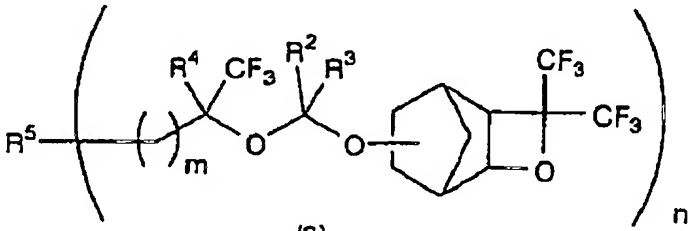
wherein R^1 represents a halogen atom, and R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group.

2. The fluorine-containing cyclic compound according to claim 1, which is represented by structural formula (2):



(2)

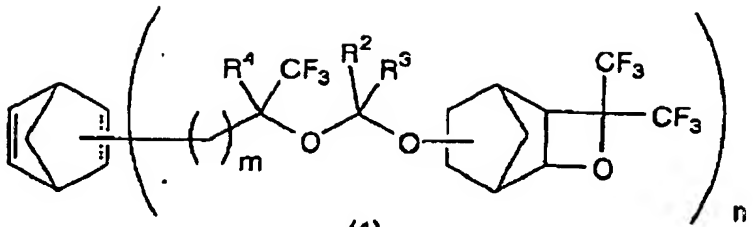
3. A fluorine-containing cyclic compound derived from the fluorine-containing cyclic compound according to claim 1 or 2, which is represented by general formula (3):



(3)

wherein R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; R^4 and R^5 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom, a sulfur atom, a carbonyl bond or a double bond, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group, and further, R^5 may be bonded to any polymer chain; n represents 1 to 5; and m represents 0 to 5.

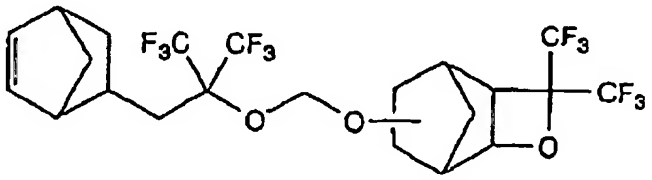
4. A fluorine-containing cyclic compound derived from the fluorine-containing cyclic compound according to claim 1 or 2, which is represented by general formula (4):



(4)

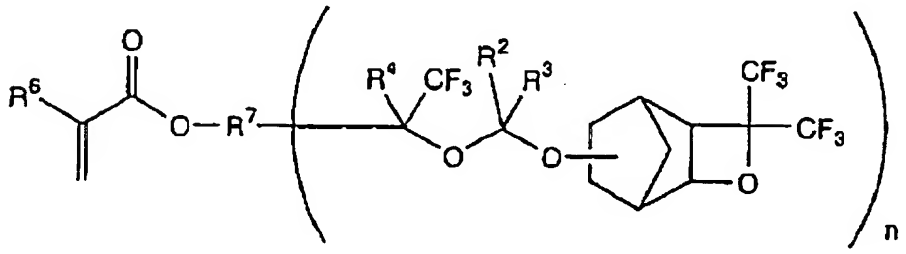
wherein R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; R^4 represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom, a sulfur atom or a carbonyl bond, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; n represents 1 to 5; and m represents 0 to 5.

5. A fluorine-containing cyclic compound represented by structural formula (5):



(5)

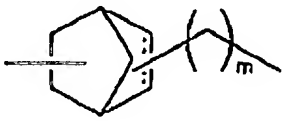
6. A fluorine-containing cyclic compound derived from the fluorine-containing cyclic compound according to claim 1 or 2, which is represented by general formula (6):



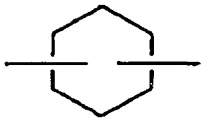
(6)

wherein R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; R^4 represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom, a sulfur atom or a carbonyl bond, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; R^6 represents hydrogen, a fluorine atom, a halogen atom, an alkyl group or a halogenated alkyl group; n represents 1 to 5; R^7 is a methylene group, a methine group, or a cyclic hydrocarbon group or aromatic hydrocarbon group represented by

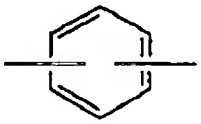
structural formulas (7) to (9), which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom as a substituent group thereof; and m represents 0 to 5 in structural formula (7).



(7)

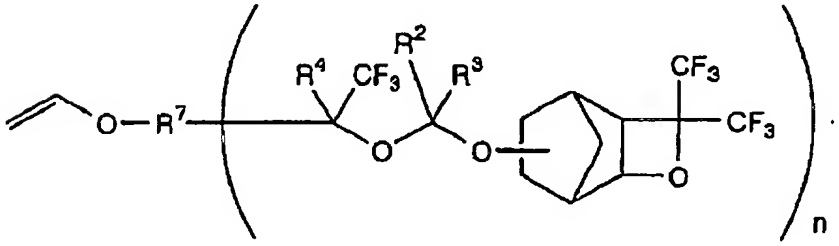


(8)



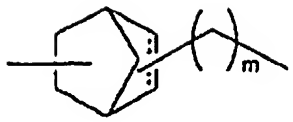
(9)

7. A fluorine-containing cyclic compound derived from the fluorine-containing cyclic compound according to claim 1 or 2, which is represented by general formula (10):

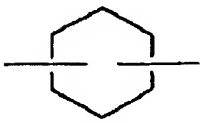


(10)

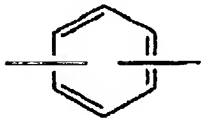
wherein R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; R^4 represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom, a sulfur atom or a carbonyl bond, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; n represents 1 to 5; R^7 is a methylene group, a methine group, or a cyclic hydrocarbon group or aromatic hydrocarbon group represented by structural formula (7) to (9), which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom as a substituent group thereof; and m represents 0 to 5 in structural formula (7).



(7)

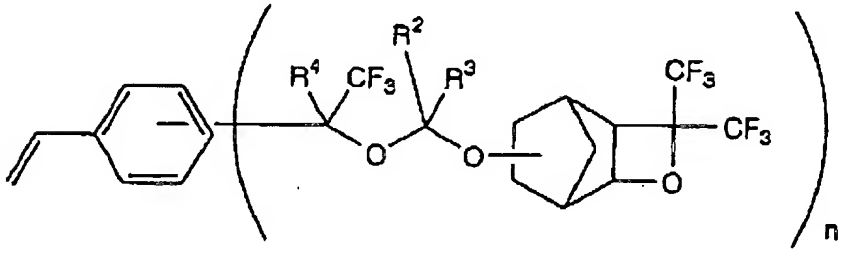


(8)



(9)

8. A fluorine-containing cyclic compound derived from the fluorine-containing cyclic compound according to claim 1 or 2, which is represented by general formula (11):

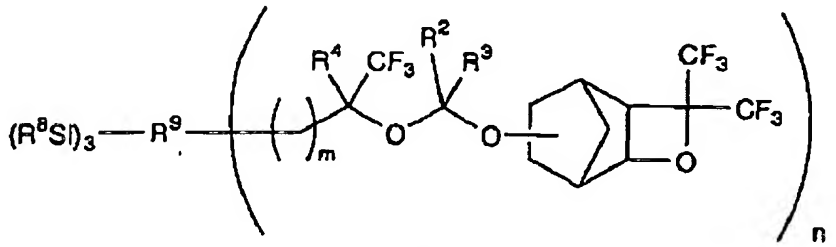


(11)

wherein R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic

hydrocarbon group; R^4 represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom, a sulfur atom or a carbonyl bond, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; n represents 1 to 5.

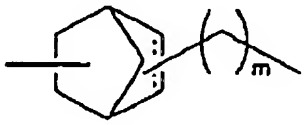
9. A fluorine-containing cyclic compound derived from the fluorine-containing cyclic compound according to claim 1 or 2, which is represented by general formula (12):



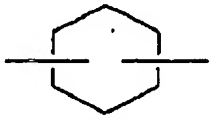
(12)

wherein R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; R^4 represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom, a sulfur atom or a

carbonyl bond, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; R^8 represents a halogen atom or an alkoxy group; n represents 1 to 5, and m represents 0 to 5; and R^9 is a cyclic hydrocarbon group represented by structural formulas (7) and (8) or an aromatic hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom as a substituent group thereof.

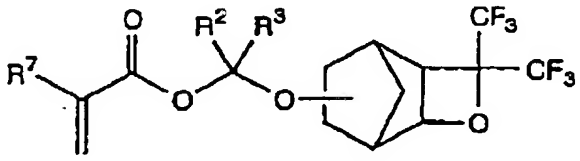


(7)



(8)

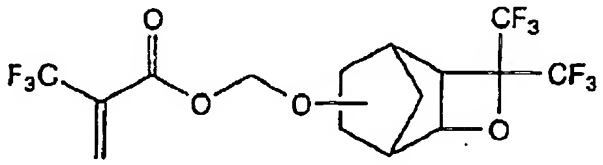
10. A fluorine-containing cyclic compound derived from the fluorine-containing cyclic compound according to claim 1 or 2, which is represented by general formula (13):



(13)

wherein R^2 and R^3 each represents hydrogen or a hydrocarbon group, the hydrocarbon group, which may contain a halogen atom, an oxygen atom, a nitrogen atom or a sulfur atom, being a straight-chain, branched or cyclic hydrocarbon group having 1 to 25 carbon atoms or an aromatic hydrocarbon group; and R^7 represents hydrogen, a fluorine atom, a halogen atom, an alkyl group or a halogenated alkyl group.

11. A fluorine-containing cyclic compound represented by structural formula (14):



(14)

12. A fluorine-containing polymer compound obtained by polymerization or copolymerization using the fluorine-containing cyclic compound according to any one of claims 3 to 11.

13. A fluorine-containing polymer obtained by reacting a polymer containing one or more functional groups selected from a carboxyl group, a hydroxyl group, a hexafluorocarbinol group, an amino group and a sulfonic

acid with the fluorine-containing cyclic compound according to claim 1 or 2.

14. A resist material using the fluorine-containing polymer compound according to claim 12 or 13.

15. A pattering process using the resist material according to claim 14.